GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

Competency-focused Outcome-based Green Curriculum-2023 (COGC-2023)
Semester -VI

Course Title: Environmental Engineering Project-II
(Course Code: 4361307)

Diploma programme in which this course is offered	Semester in which offered
Environmental Engineering	6th semester

1. RATIONALE

Environmental Engineering is emerging field that has gained lot of attention due to the problems faced by the society and environment due to industrial developments. This course focuses on the practical application of environmental engineering principles to address real-world environmental challenges. Students will work on a semester-long project that involves the design, analysis, and implementation of solutions to environmental issues. The course covers project management, data collection and analysis, environmental impact assessment, and the development of sustainable engineering solutions.

1. **Industry Defined Problem** - Student is suggested to select any Industry/Consultancy. Students are supposed to study the manufacturing process of the industry, the treatment plants and identify any problem related to air/water/solid waste management or any other pollution problem faced by the industry and suggest solutions for the same.
2. **User defined problem** – The faculty/mentor can suggest any problem related to college/society/environment and students can work upon it.

Out of 100 marks, 50 marks are to be given for Problem Definition. The college, through internal evaluation, will assess the Industry/User Defined problem solution, submitted by students during the third week of the sixth semester. The remaining 50 marks are for the practical exam, to be conducted by the University.

2. COMPETENCY

The purpose of this course is to help the student to attain the following industry identified competency through various teaching-learning experiences:

- **Develop multiple types of skills such as application of basic domain knowledge for problem analysis, design development of solutions by using engineering tools, testing and experiments for the benefit of society environment and sustainability.**
- **Acquire project management skills like planning, communication, teamwork and nurture curiosity for lifelong learning.**
- **Design and implement sustainable solutions for environmental challenges.**

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge, and the relevant soft skills associated with this competency are to be developed in the student to display the following COs:

The student will develop underpinning knowledge, adequate programming skills of competency for implementing various applications using python programming language to attain the following course outcomes.

a) Interpret data.
b) Suggest Solutions.
c) Draw conclusions
d) Lead or work as a member of a team.
e) Adhere to Safety norms.
f) Observe ethical practices.
g) Communicate effectively
h) Prepare final project report.
i) Present report.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T/2+P/2)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	CA	ESE	CA	ESE	
0	0	6	3	0	0	50	50	100

CA and ESE Assessment will be carried out based on project work by Project Guide.

***Legends: L**-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** -Practical; **C** – Credit, **CA** - Continuous Assessment; **ESE** -End Semester Examination.*

List of Documents to be prepared for Submission:

1. Project Synopsis and problem definition and solution , in the format prescribed by GTU, including
    - The details of the project selected by him/ her, the name and brief description of the organization, its address and the, Contact Person details etc.
    - Literature Survey and Research related to corresponding organization in the context of the Problem Objectives.
2. Final Project Report in the format prescribed by GTU
3. Project Presentation (PPT)

The suggested performance criteria
is given below:
a) Quality of project work: Innovativeness of problem solution, originality and utility of project
b) Quality of project report: Literature review, documentation, Success achieved in actual implimentation of idea
c) Presentation skills: Presentation of work done, Contribution as team member, Communication skills

5. PROJECT EVALUATION

a) Quality of project work: 15 Marks
b) Quality of project report: 20 Marks
c) Presentation skills: 15 Marks
Total: 50 Marks

6. AFFECTIVE DOMAIN OUTCOMES

The following affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs. More could be added to fulfill the development of this course competency.

a) Work as a leader/a team member as role of Engineer.
b) Practice environmentally friendly methods and processes.
c) Follow safety precautions and ethical practices.

7. SUGGESTED STUDENT ACTIVITIES

Following are the suggested student-related curricular, co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should perform following activities and prepare reports and give presentation in front of students and faculty members. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

a) The Semester–VI is fully allotted for actual Solution Implementation, Finding Hurdles, Troubleshooting, and correcting the design accordingly. It involves actual implementation, testing results, suggesting modifications, Reviewing Implementation and possible extension of the work as well as the utility of Project and the probable applications.
b) The Final Project Report must include, in the appendix, a calendar of the history of the project starting from shodh-yatra and the work carried out by student/s on the project work. It should also include the name and the contact details of the Faculty Guide, the Mentor (if any) and the list of members of the Group, which has worked together on the project.
c) The student will present the Report on the Problem solution Definition in presence of experts.

8. REFERENCE

GTU guidelines for diploma project

9. PO-COMPETENCY-CO MAPPING

Semester V	Environmental Engineering Project-I (Course Code: 4351305)						
	POs and PSOs						
Competency & Course Outcomes	**PO 1 Basic & Discipline specific knowledge**	**PO 2 Problem Analysis**	**PO 3 Design/ development of solutions**	**PO 4 Engineering Tools, Experimentation &Testing**	**PO 5 Engineering practices for society, sustainability & environment**	**PO 6 Project Management**	**PO 7 Life-long learning**
Competency Develop multiple types of skills such as application of basic domain knowledge for problem analysis, design development of solutions by using engineering tools, testing and experiments for the benefit of society environment and sustainability. Acquire project management skills like planning, communication, teamwork and nurture curiosity for lifelong learning. Design and implement sustainable solutions for environmental challenges							
Course Outcome a) Interpret data.	2	2	-	-	1	2	1
b) Suggest Solutions.	2	2	3	2	3	2	2
c) Draw conclusions	2	2	2	-	3	2	2
d) Lead or work as a member of a team	2	3	-	-	2	2	-
e)Adhere to Safety norms.	2	-	-	-	2	2	1
f) Observe ethical practices.	-	-	-	-	3	3	2
g)Communicate effectively	2	-	-	-	-	2	2
h) Prepare final project report.	2	2	2	2	2	2	3
i)Prepare project report.	2	-	-	-	-	2	3

Legend: '**3'** for high, '**2**' for medium, **'1'** for low or **'-'** for the relevant correlation of each competency, CO, with PO/ PSO

10. COURSE CURRICULUM DEVELOPMENT COMMITTEE

GTU Resource Persons

Sr. No.	Name and Designation	Institute	Email
1	Mrs. Jini Sunil	Shri K.J. Polytechnic, Bharuch	jinivt@rediffmail.com